What is claimed is:

1. A magnetic memory comprising a magnetic substance composed of a disc-shaped first magnetic layer and a ring-shaped second magnetic layer which is formed on said first magnetic layer.

2. The magnetic memory as defined in claim 1, wherein ratio (D2/D1) is set within 0.1-0.8 on condition that an outside diameter and an inside diameter of said second magnetic layer are designated by D1 and D2, respectively.

3. The magnetic memory as defined in claim 2, wherein said outside diameter D1 of said second magnetic layer is set within 100-1500nm and said inside diameter D2 of said second magnetic layer is set within 10-1200nm.

4. The magnetic memory as defined in claim 1, wherein ratio (t1/t2) is set within 1/5-5 on condition that thicknesses of said first magnetic layer and said second magnetic layer are designated by t1 and t2, respectively.

5. The magnetic memory as defined in claim 4, wherein said thickness t1 of said first magnetic layer t1 is set within 4-20nm, and said thickness t2 of said second magnetic layer t2 is set within 4-20nm.

6. The magnetic memory as defined in claim 1, wherein said first magnetic layer and said second magnetic layer are made of room temperature ferromagnetic material.

7. The magnetic memory as defined in claim 1, wherein a magnetization of said second magnetic layer is rendered right handed (clockwise) direction or left handed (anticlockwise) direction along surfaces of said second magnetic layer.

8. The magnetic memory as defined in claim 1, wherein a periphery of said magnetic substance is notched.

9. The magnetic memory as defined in claim 8, wherein ratio (h/H) is set to 0.006 or over on condition that a height of a notch of said periphery of said magnetic substance is designated by h, and an outside diameter of said magnetic substance is designated by H.

10. The magnetic memory as defined in claim 1, further comprising a ring-shaped third magnetic layer on said magnetic substance via a non-magnetic layer.

11. The magnetic memory as defined in claim 10, wherein a thickness t3 of said third magnetic layer is set within 5-20nm.

12. The magnetic memory as defined in claim 10, wherein said third magnetic layer is made of room temperature ferromagnetic material.

13. The magnetic memory as defined in claim 10, further comprising an antiferromagnetic layer so as to be adjacent to a main surface of said third magnetic layer remote from said magnetic substance.

14. The magnetic memory as defined in claim 10, wherein a magnetization of said third magnetic layer is rendered right handed (clockwise) direction or left handed (anticlockwise) direction along surfaces of said third magnetic layer.

15. The magnetic memory as defined in claim 14, wherein said direction of said third magnetic layer is pinned.

16. A magnetic memory array comprising a plurality of magnetic memories as defined in any one of claims 1-15 which are arranged regularly.

17. A method for fabricating a magnetic memory, comprising the steps of:

preparing a given substrate,

forming a mask with circular openings on a main surface of said substrate,

introducing magnetic particles into said openings of said mask on said main surface of said substrate at a given inclination angle from a normal line to said main surface with rotating said substrate, to form a magnetic substance composed of a disc-shaped first magnetic layer and a ring-shaped second magnetic layer which are successively stacked.

18. The fabricating method as defined in claim 17, wherein said inclination angle is set within 30-60 degrees from said normal line to said main surface.

19. A method for recording in a magnetic memory, comprising the steps of:

stacking a disc-shaped first magnetic layer and a ring-shaped second magnetic layer successively to form a magnetic substance,

applying an external magnetic field to said magnetic substance to generate a vortex magnetization in said first magnetic layer,

generating a right handed (clockwise) vortex magnetization or a left handed (anticlockwise) vortex magnetization in said second magnetic layer along surfaces of said magnetic layer by utilizing said vortex magnetization of said first

magnetic layer as nucleus, and

storing information "0" or "1" on said right handed (clockwise) vortex magnetization or said left handed (anticlockwise) vortex magnetization of said second magnetic layer.

20. The recording method as defined in claim 19, wherein ratio (D2/D1) is set within 0.1-0.8 on condition that an outside diameter and an inside diameter of said second magnetic layer are designated by D1 and D2, respectively.

21. The recording method as defined in claim 20, wherein said outside diameter D1 of said second magnetic layer is set within 100-1500nm and said inside diameter D2 of said second magnetic layer is set within 10-1200nm.

22. The recording method as defined in claim 19, wherein ratio (t1/t2) is set within 1/5-5 on condition that thicknesses of said first magnetic layer and said second magnetic layer are designated by t1 and t2, respectively.

23. The recording method as defined in claim 22, wherein said thickness t1 of said first magnetic layer t1 is set within 4-20nm, and said thickness t2 of said second magnetic layer t2 is set within 4-20nm.

24. The recording method as defined in claim 19, wherein said first magnetic layer and said second magnetic layer are made of room temperature ferromagnetic material.

25. The recording method as defined in claim 19, wherein a periphery of said magnetic substance is notched.

26. The recording method as defined in claim 25, wherein ratio (h/H) is set to 0.006 or over on condition that a height of a notch of said periphery of said magnetic substance is designated by h, and an outside diameter of said magnetic substance is designated by H.

27. A method for reading out from a magnetic memory, comprising the steps of:

stacking a disc-shaped first magnetic layer and a ring-shaped second magnetic layer successively to form a magnetic substance,

forming a ring-shaped third magnetic layer on said magnetic substance via a non-magnetic layer, to complete said magnetic memory,

applying an external magnetic field to said magnetic substance to generate a vortex magnetization in said first magnetic layer,

generating a right handed (clockwise) vortex magnetization or a left handed (anticlockwise) vortex magnetization in said second magnetic layer along surfaces of said magnetic layer by utilizing said vortex magnetization of said first magnetic layer as nucleus,

storing information "0" or "1" on said right handed (clockwise) vortex magnetization or said left handed (anticlockwise) vortex magnetization of said second magnetic layer, and

detecting a change in electric current due to a change in electric resistance of said magnetic memory on relative direction of a magnetization of said second magnetic layer for a magnetization of said third magnetic layer.

28. The reading out method as defined in claim 27, further comprising the step of forming an antiferromagnetic layer so as to be adjacent to a main surface of said third magnetic layer remote from said magnetic substance to pin said magnetization of third magnetic layer.

29. The reading out method as defined in claim 27, wherein ratio (D2/D1) is set within 0.1-0.8 on condition that an outside diameter and an inside diameter of said second magnetic layer are designated by D1 and D2, respectively.

30. The reading out method as defined in claim 29, wherein said outside diameter D1 of said second magnetic layer is set within 100-1500nm and said inside diameter D2 of said second magnetic layer is set within 10-1200nm.

31. The reading out method as defined in claim 27, wherein a periphery of said magnetic substance is notched.

32. The reading out method as defined in claim 31, wherein ratio (h/H) is set to 0.006 or over on condition that a height of a notch of said periphery of said magnetic substance is designated by h, and an outside diameter of said magnetic substance is designated by H.

33. The reading out method as defined in claim 27, wherein a thickness t1 of said first magnetic layer t1 is set within 4-20nm, and a thickness t2 of said second magnetic layer t2 is set within 4-20nm.

34. The reading out method as defined in claim 27, wherein said first magnetic layer, said second magnetic layer and said third magnetic layer are made of room temperature ferromagnetic material.